ATC Operations Analysis via Automatic Recognition of Clearances, Phase II

Completed Technology Project (2011 - 2013)

Project Introduction

Recent advances in airport surface surveillance have motivated the creation of new tools for analysis of Air Traffic Control (ATC) operations, such as the Surface Operations Data Analysis and Adaptation (SODAA) tool, which is being used by NASA to conduct airport ATC operations analysis. What is missing from ATC operations analysis, however, is accessible and reliable data regarding the clearances issued by the controller and other communication conducted with the pilot that influences the behavior seen in the surveillance data. The reliance on voice communication in ATC operations presents challenges to the researcher who is trying to obtain data and conduct detailed analyses of ATC operations. During the Phase I effort, we designed and developed a prototype system to perform automatic speech recognition (ASR) of ATC clearances. We demonstrated the feasibility of recognizing ATC clearances from speech audio data and associating the clearance data with the flight that is the subject of the clearance. In the Phase II effort, we will create a complete prototype of the ATC speech recognition, processing and analysis capability in SODAA. In addition, we will integrate ATC speech recognition capabilities into a real-time application in the Surface Management System (SMS).

Primary U.S. Work Locations and Key Partners
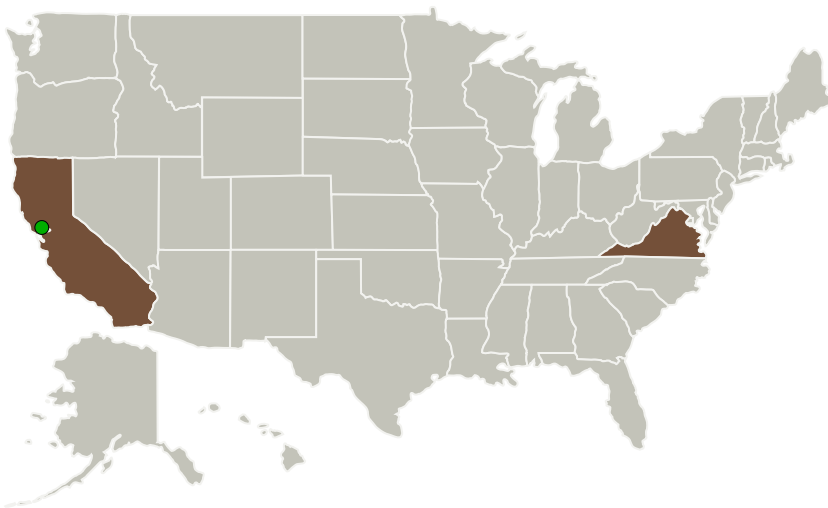
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Organizations Performing Work	Role	Type	Location
Mosaic ATM, Inc.	Lead Organization	Industry	Leesburg, Virginia
🟢Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Virginia

Project Transitions

▶ **June 2011:** Project Start

✓ **July 2013:** Closed out

   Closeout Documentation:
   - Final Summary Chart*(https://techport.nasa.gov/file/138710)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Mosaic ATM, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

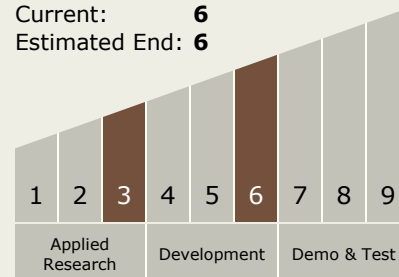**Principal Investigator:**
Chris Brinton

Co-Investigator:
Chris Brinton

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**

1	2	3	4	5	6	7	8	9
	Applied Research			Development			Demo & Test	

Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  └ TX16.3 Traffic Management Concepts

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System